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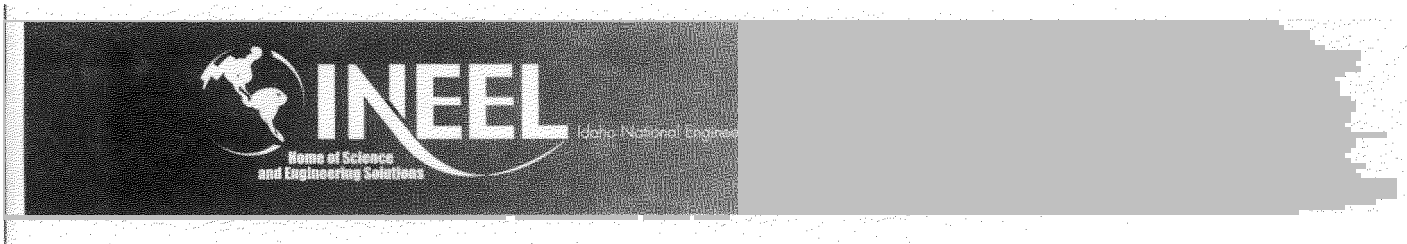
Revision 1
January 2003

U.S. Department of Energy
Idaho Operations Office

Fiscal Year 2002 Operations and Maintenance Report for the Central Facilities Area, Operable Unit 4-13



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Prepared for the
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Approved by

R G Jones — 1/3/03

Robert E. James
WAG 4 Project Manager

Date

D H Preussner — 01/03/03

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WAG 4 Project Engineer

Date

ABSTRACT

This Operations and Maintenance (O&M) Report provides and documents the operations and maintenance activities and inspection of the remedies and Record of Decision-mandated institutional controls for the Central Facilities Area sites under Operable Unit 4-13 at the Idaho National Engineering and Environmental Laboratory. Annual inspection of institutional controls is required by the Operable Unit 4-13 Record of Decision. This report fulfills the requirement for the second annual inspection.

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FIGURES

TABLES

ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFLUP	Comprehensive Facility and Land-Use Plan
DOE-ID	Department of Energy Idaho Operations Office
EPA	Environmental Protection Agency
FY	fiscal year
IC	institutional control
INEEL	Idaho National Engineering and Environmental Laboratory
O&M	operations and maintenance
OU	operable unit
ROD	Record of Decision
SAT	Science Action Team
WAG	waste area group

Fiscal Year 2002 Operations and Maintenance Report for the Central Facilities Area, Operable Unit 4-13

1. INTRODUCTION

The purpose of this Institutional Controls (ICs) Monitoring Report is to document the Fiscal Year (FY) 2002 annual operations and maintenance (O&M) and IC status inspection conducted for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites in Waste Area Group (WAG) 4, Operable Unit (OU) 4-13 at the Idaho National Engineering and Environmental Laboratory (INEEL).

This report documents the O&M activities and status of ICs at the five WAG 4 institutionally controlled sites: Central Facilities Area (CFA) 01 (CFA Landfill I), CFA-02 (CFA Landfill II), CFA-03 (CFA Landfill III), CFA-07 (French drains), and CFA-08 (sewage plant drain field). It includes site inspection checklists, photographs of ICs at these sites, maps depicting locations of required maintenance, and topographical survey data and maps for CFA-01, CFA-02, CFA-03, and CFA-08.

In addition to the routine monitoring and inspections, the INEEL Environmental Restoration (ER) department sponsored a Science Action Team (SAT) to study and survey vegetation and rooting depths, and small mammals and small-mammal burrows for WAG 4. These studies focused on the CFA Landfills I, II, and III, and a control area east of Landfill III. The results of these studies are documented in an external report, "Science Action Team 2002 Report for Waste Area Group 4 (Stacey 2002)."

2. BACKGROUND

2.1 Background of Idaho National Engineering and Environmental Laboratory/Central Facilities Area

The INEEL is a government-owned/contractor-operated facility managed by the Department of Energy Idaho Operations Office (DOE-ID) that is located 51 km (32 mi) west of Idaho Falls, Idaho (see Figure 2-1). The INEEL encompasses portions of five Idaho counties: (1) Butte, (2) Jefferson, (3) Bonneville, (4) Clark, and (5) Bingham, occupying 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain (see Figure 2-1).

The CFA (location of WAG 4 sites) is located at the INEEL, as shown in Figure 2-1. The CFA includes buildings built in the 1940s and 1950s to house Navy gunnery-range personnel, administration offices, a shop, and warehouse space. The facilities have been modified over the years to fit changing needs. Presently, the CFA provides four major types of functional space: crafts, administrative offices, maintenance services, and a laboratory.

Based upon the OU 4-13 ROD, remedies for 52 sites were evaluated under the Comprehensive Remedial Investigation/Feasibility Study. Of these 52 sites, the ROD requires current ICs at five sites: the CFA-01, CFA-02, and CFA-03 Landfills; the CFA-07 French Drains; and the CFA-08 Sewage Plant Drain Field. One of these sites, CFA-08 Sewage Plant Drain Field, and two other sites require remedial action per the ROD. The CFA-08 Sewage Plant Drain Field remediation is scheduled for completion in the current year 2002. The CFA-10 Transformer Yard, was remediated in FY 2001 to below the Environmental Protection Agency (EPA) residential screening level of 400 mg/kg for lead and does not require ICs. The other site, the CFA-04 mercury pond, is scheduled to be remediated in 2003, and does not currently require ICs and is not anticipated to require ICs after the remediation.

Rationale for the need of ICs at the five sites varies. The CFA-01, the CFA-02, and the CFA-03 Landfills were capped with a native soil cover per the OU 4-12 ROD and require continuing ICs to maintain the integrity of the cover (DOE/ID 2000). The CFA-07 French Drains were removed in a nontime critical removal action and require ICs to protect use against the potential for radioactivity and lead beneath the removal action site at depths greater than 2.4–3 m (8–10 ft). The CFA-08 Sewage Plant Drain Field was capped with a native soil cover to limit exposure to cesium-137 contamination and requires ICs before and after remediation to limit occupational and residential access, respectively. Figure 2-2 shows the location of these five WAG 4 sites that require ICs.

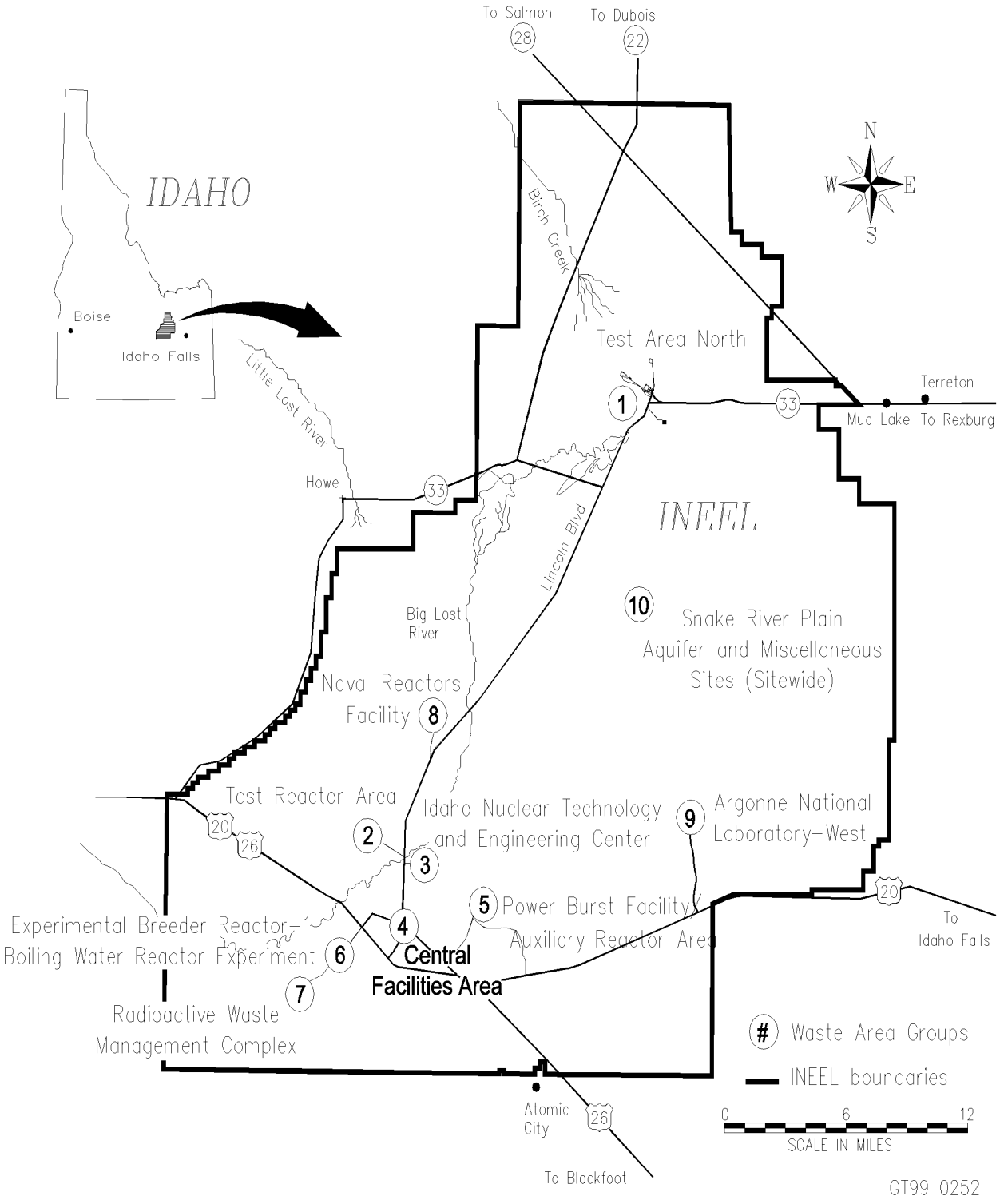

Figure 2-1. The Idaho National Engineering and Environmental Laboratory.

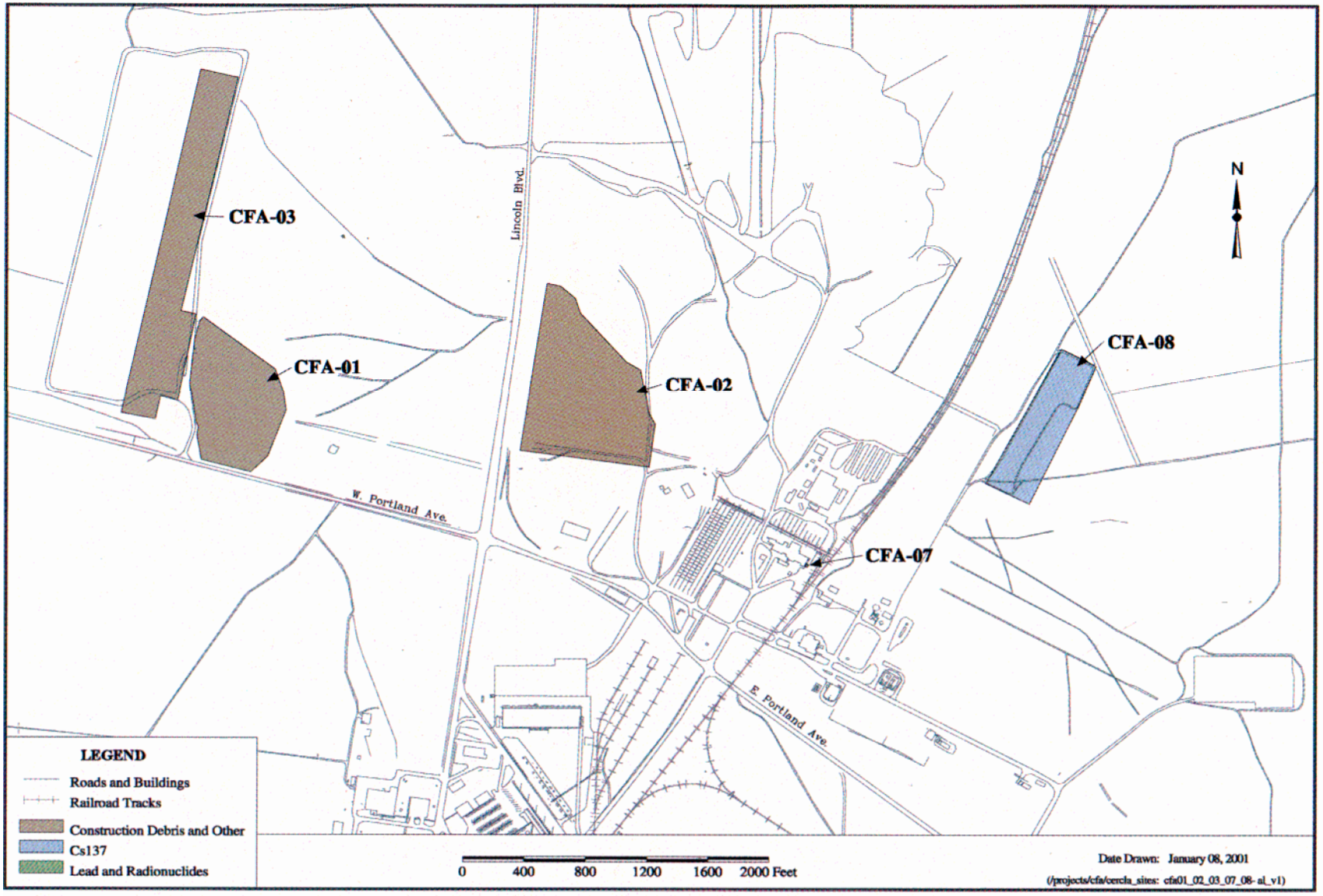

Figure 2-2. Location of WAG 4 institutional control sites at CFA as identified by WAG 4 OU 4-13 Comprehensive ROD.

Inclusion of ICs for these sites is consistent with the *EPA Region 10 Policy on the Use of Institutional Controls at Federal Facilities* (EPA 1999) and with the requirement under CERCLA that, when waste is left in place above levels that allow unlimited use, appropriate controls must be in place to limit exposure and achieve acceptable levels of risk.

2.2 INEEL Comprehensive Facility and Land-Use Plan

The INEEL Comprehensive Facility and Land-Use Plan (CFLUP) (DOE-ID 1996) documents and displays current and anticipated future land use and facility use at the INEEL. It provides guidance on facility and land use at the INEEL through the 100-year scenario, which will be explained below. The CFLUP is updated, as needed, when information, such as land use, changes and includes specific land-use information about the CFA facility.

Land-use projections in the INEEL CFLUP incorporate the assumption that the INEEL will remain under government management and control for at least the next 100 years. A mix of land uses across the INEEL is anticipated to include unrestricted industrial uses, government-controlled industrial uses, unrestricted areas, controlled areas for wildlife management and conservation, and waste management areas. No residential development will be allowed within INEEL boundaries, and no new major private developments (residential or nonresidential) on public lands are expected in areas adjacent to the Site. Grazing will be allowed to continue in the buffer area.

Survey data, pictures, and IC requirements for the five OU 4-13 CERCLA sites have been recorded and incorporated into the CFLUP. Information regarding the remedial action at CFA-08 has been provided for incorporation into the next revision of the CFLUP.

3. DESCRIPTION OF FY 2002 OPERATIONS AND MAINTENANCE

The annual O&M and institutional control inspection for WAG 4, OU 4-13 was conducted on October 16, 2002. All five WAG 4 sites with ICs were visited. The WAG 4 technical task lead and two other technical support personnel performed the inspections. The following subsections detail the inspection results and other O&M activites conducted at the OU 4-13 sites. Appendix A contains the checklists used during the FY 2002 annual O&M inspections, and Appendix B contains the photographs from the inspections.

3.1 Institutional Controls

The ICs at the five OU 4-13 sites include a combination of visible access restrictions, control of activities, prevention of unauthorized access and land-use restrictions. Specific to sites CFA-01, CFA-02 and CFA-03, fences surround each landfill with CERCLA warning signs placed on the fencing. The CERCLA signs with point-of-contact information were still in place and intact at each of the landfills. The CERCLA sign at site CFA-07 French Drain was in place and intact.

3.2 Soil Cover Erosion, Subsidence, and Intrusion

The soil covers at sites CFA-01, CFA-02 and CFA-03 were inspected for erosion, subsidence and intrusion in accordance with the OU 4-13 O&M plan (DOE/ID 2002). Visual inspections were conducted at each of the landfills to identify areas of concern where the soil covers may have been compromised. The Science Action Team (SAT) study conducted at Landfills I, II and III during the summer of 2002 identified several erosion rills on the landfills, but primarily on Landfill II. There was one area of subsidence identified on Landfill III. Small animal intrusion was also noted on Landfill III. The areas identified during the FY 2002 survey area indicated in Figures 3-1, 3-2 and 3-3.

Areas of small mammal burrows were identified primarily on Landfill III, the largest of which is identified in Figure 3-3. This is consistent with the observations of the SAT study results that identified over three times the number of small mammal burrows in Landfill III than in Landfills I and II (Stacey 2002).

As specified in the OU 4-13 O&M plan (DOE/ID 2002), the erosion rills and small mammal burrows have been identified for maintenance activities during FY 2003 and are pictured in Appendix B. The rills and burrows will be backfilled and returned to grade. Revegetation of these areas will be completed as necessary.

The CFA-08 engineered cover is complete, and has been revegetated. As such, the first inspection for erosion, subsidence, and intrusion will be conducted during the FY 2002 O&M inspection.

3.3 Topographic Survey

Topographic surveys were conducted at sites CFA-01, CFA-02 and CFA-03 and at the rock armor on the north end of CFA-02. The topographic surveys were conducted in accordance with the O&M plan, and evaluated to determine if there was any subsidence or structural failure of the covers. A 30.5- × 30.5-m (100- × 100-ft) grid has been established at the three landfills, and a 9- × 9-m (30- × 30-ft) grid has been established for the rock armor on the north end of CFA-02 Landfill II. The topographic survey data was analyzed to determine if there was subsidence in any of the surveyed locations in excess of 15 cm (6 in) on the landfill surfaces, and 30 cm (12 in) on the rock armor. The results of the topographic survey do not indicate any areas of subsidence. The topographic survey data are in Appendix C.

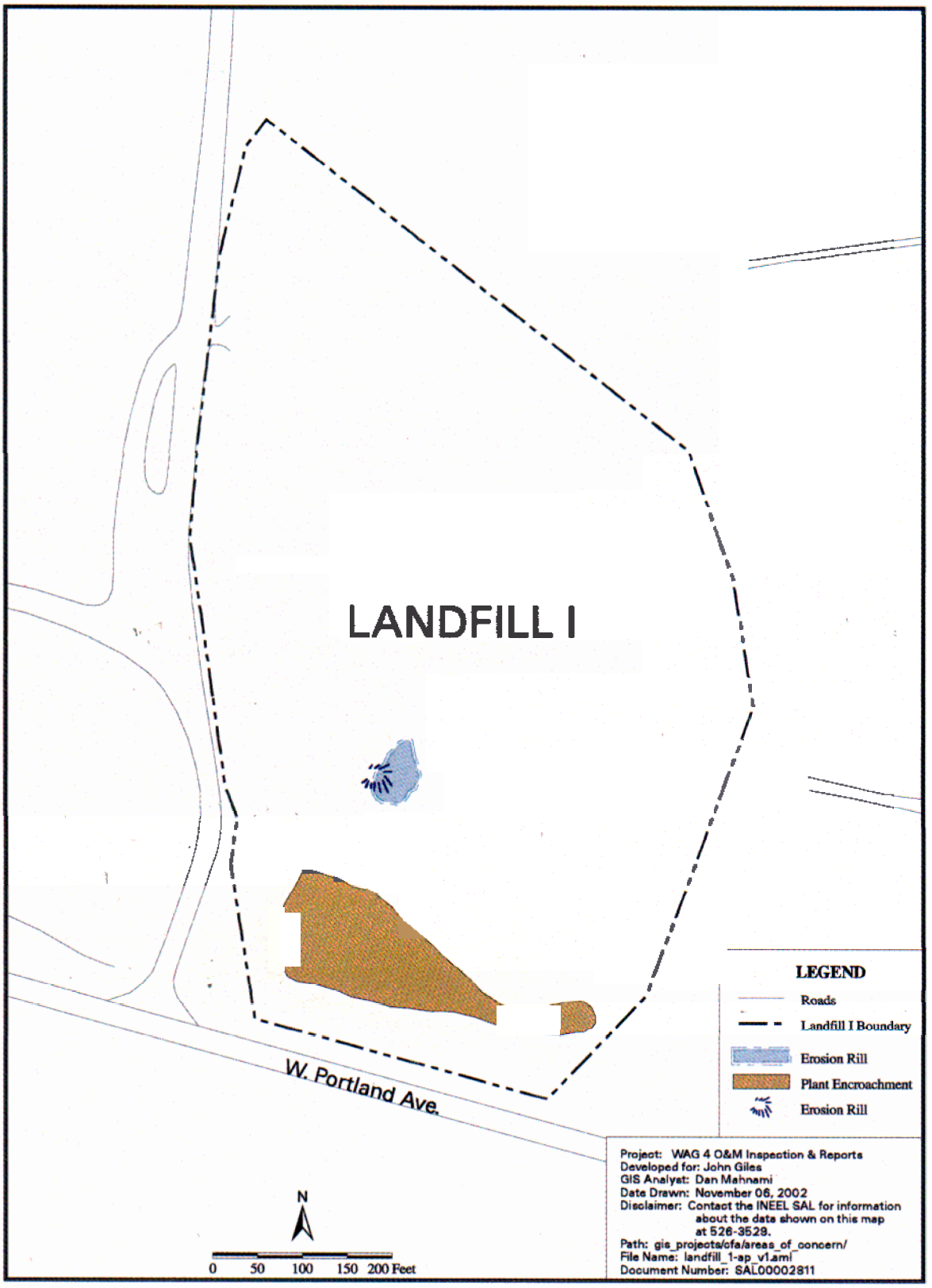

Figure 3-1. CFA-01 Landfill I areas of erosion and plant encroachment identified during FY 2002 inspections.

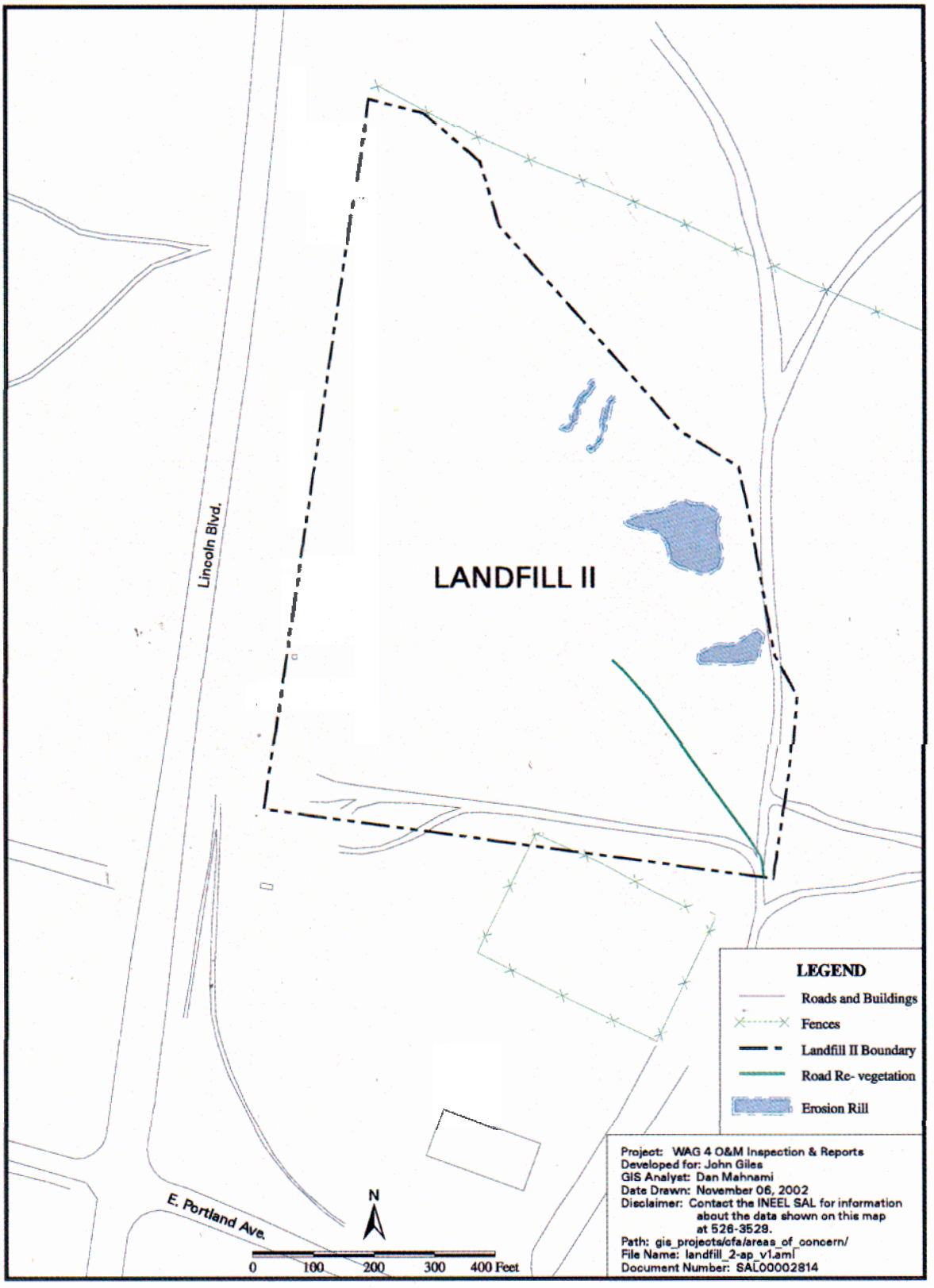

Figure 3-2. CFA-02 Landfill II areas of erosion and sparse vegetation identified during FY 2002 inspections.

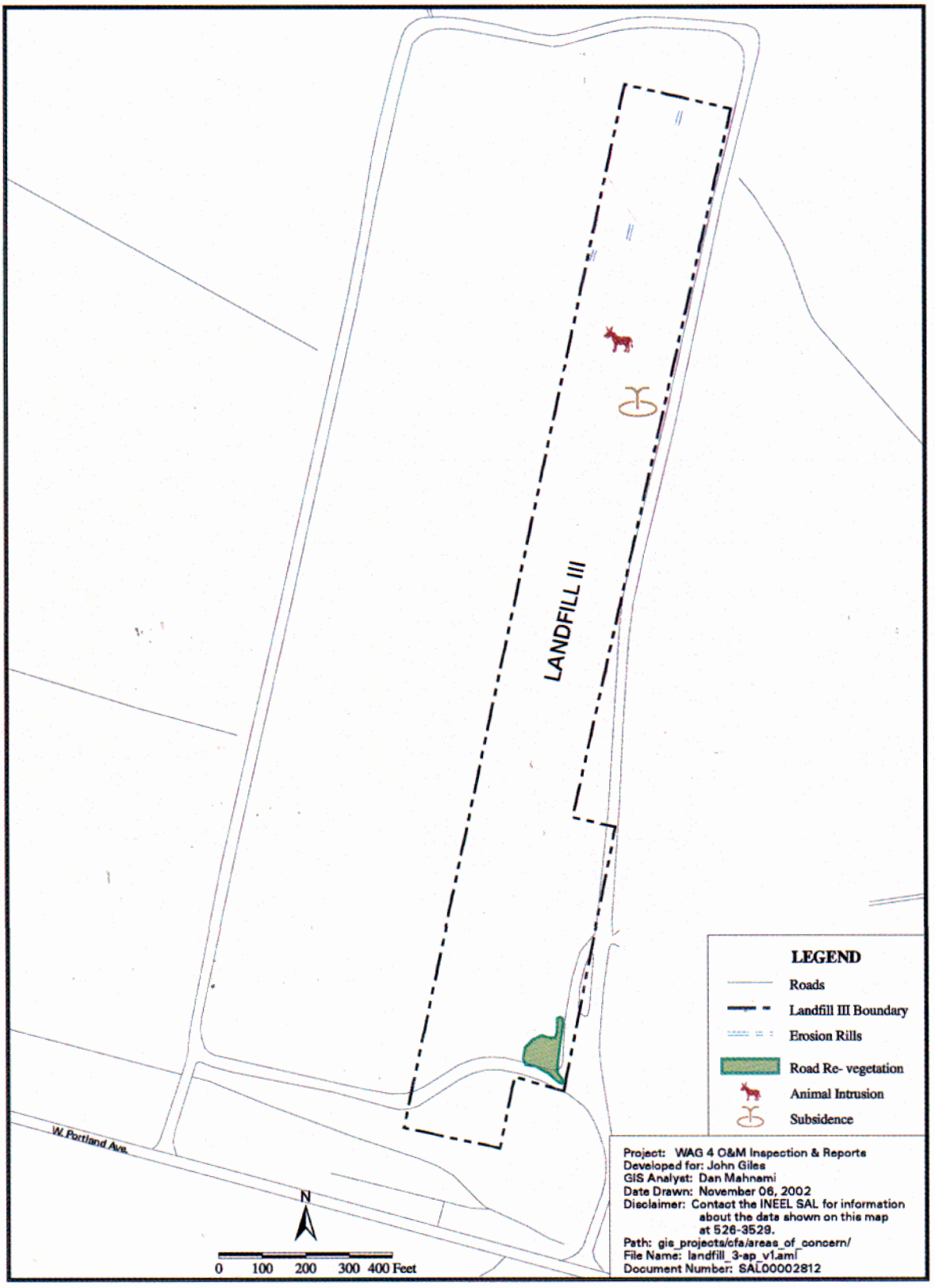

Figure 3-3. CFA-03 Landfill III areas of erosion, subsidence, animal intrusion, and sparse vegetation identified during FY 2002 inspections.

3.4 Soil Cover Vegetation

The vegetative cover at CFA-01, CFA-02, and CFA-03 was assessed during the FY 2002 inspections and during the Science Action Team study conducted at the landfills. In general, the vegetative cover is well established at Landfills I, II and III. The predominant vegetation at the landfills is crested wheat grass and immature wheat grass. Primary encroachment of weeds and deep rooting plants occurs at the perimeter of each of the landfills; however, in the case of Landfill III, thistle and alfalfa are present in several locations across the landfill. Additionally, there is a significant stand of rabbit brush that is encroaching in the southern portion of Landfill I. Vegetation that is not part of the cover design should be removed. To this end, weed control maintenance is planned for the spring of 2003 for the three landfills.

There were two areas of sparse vegetation identified during the FY 2002 inspection and the SAT study. These areas occur on Landfills II and III. Landfill II has an area immediately adjacent to the entrance gate in the southeast corner where the vegetation is very sparse from what appears to be vehicle traffic. The sparse area of vegetation extends along a narrow strip in a northwesterly direction towards the time domain reflectometry array located near the center of Landfill II. Landfill III also has an area immediately adjacent to the entrance gate on the east side where the vegetation is very sparse from what appears to be vehicle traffic. These areas have been identified for revegetation maintenance during FY 2003.

The revegetation of the CFA-08 engineered cover was completed the fall of 2002. As such, there is no vegetation growing at this time on the CFA-08 engineered cover. The first evaluation of the vegetation on the CFA-08 cover will be conducted during the FY 2003 O&M inspection.

3.5 Rock Armor at Landfill II

The rock armor on the north end of CFA-02 Landfill II was visually inspected during the FY 2002 annual O&M inspection. There was no visual evidence of subsidence or erosion, which is further supported by the results of the topographic survey discussed in Section 3.3.

3.6 Radiological Monitoring

The remedial action at the CFA-08 Sewage Plant Drain Field was completed the fall of 2002. Before completion of the fencing and vegetation of the cover, a baseline radiological survey of the cover was conducted in the fall of 2002. The survey was performed with in situ high-purity germanium gamma-ray spectrometers positioned at a fixed height of 1 m (3.3 ft) above the ground. Measurements were made on a systematic grid that covered the top surface and toe of the engineered cover. Appendix D contains the coordinates of the survey points and the reported Cs-137 concentrations (pCi/g) and uncertainties. The results of the baseline radiological survey are presented in Figure 3-4.

During the radiological survey there were 217 points measured, with 127 positive detects at the 95% confidence level. The Cs-137 concentrations ranged from 0.01 ± 0.003 pCi/g to 1.3 ± 0.36 pCi/g (2-sigma uncertainty). The average concentration was 0.35 pCi/g with a standard deviation of 0.27 pCi/g. The 95 % upper tolerance limit at the 95% confidence level for the background Cs-137 concentration at the site as reported by Rood, et al., is 0.82 pCi/g. The remaining 90 points that were measured were below the lower limit of detection of the system. Based on the results of the radiological survey, it is conclusive that Cs-137 levels in the surface soils of the newly constructed engineered cover are below the INEEL background concentrations.

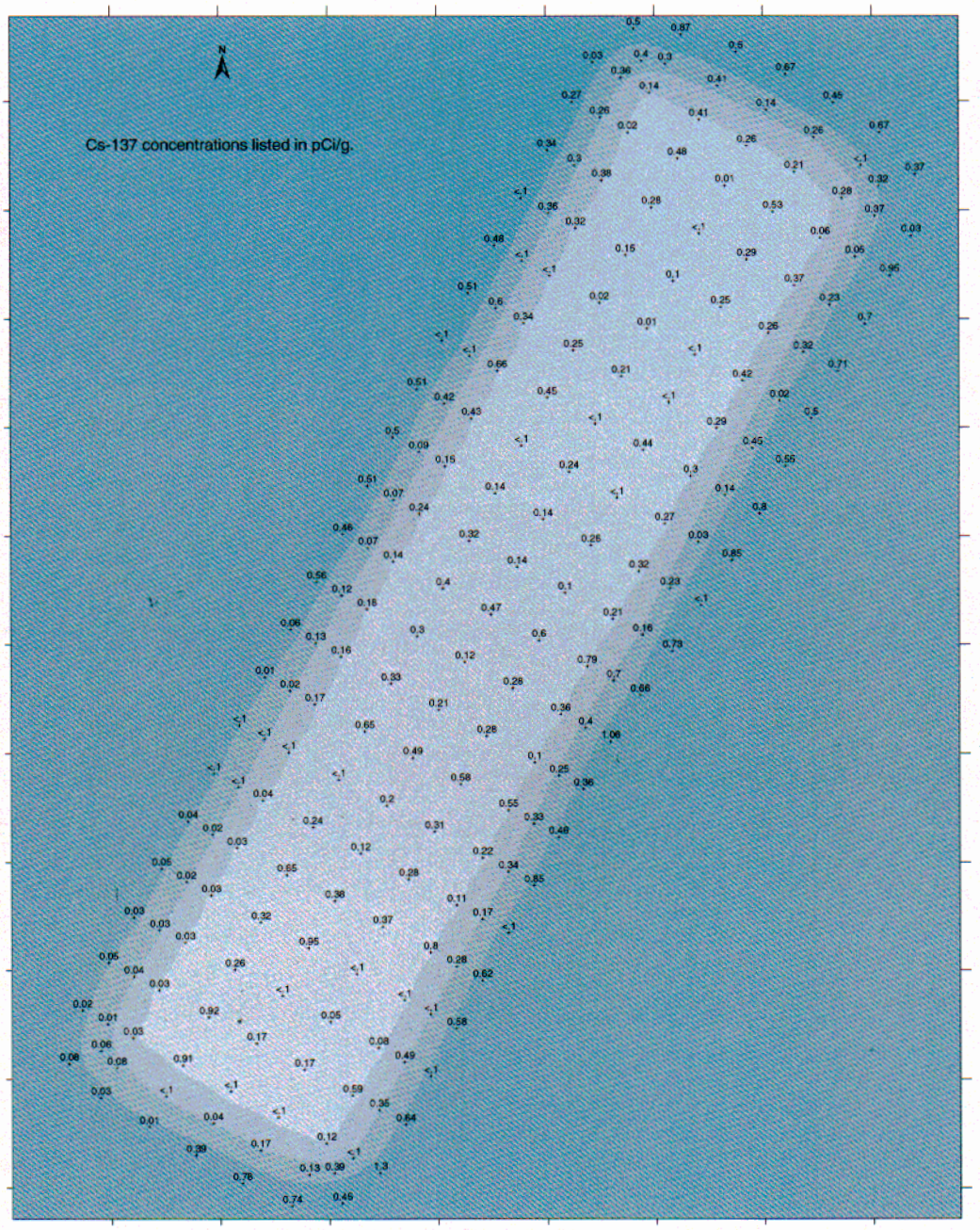

Figure 3-4. CFA-08 radiological survey results, Cs-137 concentrations in pCi/g.

3.7 Maintenance Activities

3.7.1 FY 2002 Maintenance Activities

The two maintenance activities were conducted during FY 2002:

- The TDR cell phones were re-programmed in November and December 2001.
- Repairs were completed on the 2- to 4-ft, 4- to 6-ft, and 6- to 8-ft west TDR array and on the 0- to 2-ft east TDR array.

3.7.2 FY 2003 Planned Maintenance Activities

Maintenance activities planned for FY 2003 were identified during the FY 2002 inspections. These activities include the following:

- Filling and regrading of erosion rills, subsidence, and small mammal burrows.
- Revegetation of the regraded areas and sparse vegetation areas at Landfills II and III identified during the FY 2002 inspections.
- Application of herbicides at Landfills I, II, and III to control the spread of noxious weeds and deep-rooting plants.

The weeds and plants that have been targeted for control at the landfills are listed in Table 3-1.

Table 3-1. Target list for vegetation control at CFA-01, CFA-02 and CFA-03 sites.

CFA-01 Landfill I	CFA-02 Landfill II	CFA-03 Landfill III
Alfalfa	Alfalfa	Alfalfa
Canadian thistle	Canadian thistle	Canadian thistle
Musk thistle	Musk thistle	Cheat grass
Russian thistle	Russian thistle	Dandelion
Cheat grass	Dandelion	Gray rabbit brush
Gray rabbit brush	Gray rabbit brush	Sagebrush
Sagebrush	Green rabbit brush	
	Sagebrush	

4. REFERENCES

42 USC § 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA/Superfund)," *United States Code,* December 1980.

DOE-ID, 1995, *Record of Decision for Central Facilities Area Landfills I, II, and III (Operable Unit 4-12), and No Action Sites (Operable Unit 4-03)*, DOE/ID-10146, Department of Energy Idaho Operations Office, October 1995.

DOE-ID, 1996, *INEEL Comprehensive Facility and Land-use Plan,* DOE/ID-10514, Rev. 0, Department of Energy Idaho Operations Office, March 1996.

DOE-ID, 2000, *Final Comprehensive Record of Decision for Central Facilities Area Operable Unit 4-13*, DOE/ID-10719, Rev. 2, Department of Energy Idaho Operations Office, July 2000.

DOE-ID, 2002, *Operations and Maintenance Plan for the Final Selected Remedies and Institutional Controls at Central Facilities Area, Operable Unit 4-13*, DOE/ID-10931, Revision 0, Department of Energy Idaho Operations Office, March 2002.

EPA, 1999, *Region 10 Final Policy on the Use of Institutional Controls at Federal Facilities*, Memorandum, U.S. Environmental Protection Agency, Region 10, May 1999.

Stacey, S. J., Courtney Pickup, 2002, *Science Action Team 2002 Report for Waste Area Group 4*, INEEL/EXT-02-01058, Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho, September 2002.

Appendix A

Fiscal Year 2002 Operable Unit 4-13 Operations and Maintenance Inspection Checklists

ANNUAL INSPECTION REPORT FORM FOR WAG 4

INSTITUTIONAL CONTROL PLAN AND OPERATION AND MAINTENANCE PLAN

Date 16-OCT-02 **CFA-01, -02, and –03 Landfills** **Inspector** JRG

INSPECTION ACTIVITY AT LANDFILLS	CFA-01	CFA-02	CFA-03	COMMENTS/RECOMMENDED REPAIR
INSTITUTIONAL CONTROLS				
1. Document signs/markers are in place.	✓	✓	✓	All signs & markers are in place.
2. Document fences/barriers restrict access.	✓	✓	✓	Fencing and gates are intact around landfill perimeters.
VEGETATIVE COVER				
1. Inspect for non-growth areas.	✓	✓	✓	CFA-01 Vegetative cover is excellent w/ minor encroachment of rabbitbrush. CFA-02 & CFA-03 have areas near gates that require revegetation. Locations GPS'd. Significant number of undesirable plants on CFA-03.
2. Inspect for sparse growth areas.	✓	✓	✓	
3. Inspect for weed encroachment.	✓	✓	✓	
SOIL COVER				
1. Inspect for erosion areas.	✓	✓	✓	Erosion rills exceeding criteria set in O&M plan identified on CFA-02 & 03. Small area (36 ft²) of localized subsidence on CFA-03. Animal (coyote) mammal skull burrow on CFA-03
2. Inspect for subsidence areas or slope movement.	✓	✓	✓	
3. Inspect for animal intrusion.	✓	✓	✓	
4. Conduct topographical survey.	✓	✓	✓	Topographical survey completed on CFA-01, 02 & 03 by Bob Sutherlin.
TIME DOMAIN REFLECTOMETER (TDR)				
1. Inspect cabinet interior for unusual dirt or debris.		✓	✓	TDRs inspected during each monitoring event.
2. Inspect exterior and interior of cabinet for deterioration and presence of moisture or water.		✓	✓	Cabinet exteriors and guard posts inspected during O&M inspection. Solar panel visually inspected.
3. Inspect solar collector barrel for condition/function.		✓	✓	
4. Inspect and verify presence of guard post.		✓	✓	

Printed Name of Inspector John R. Giles

Photographs Taken? (Yes) No

Signature John R Giles

ANNUAL INSPECTION REPORT FORM FOR WAG 4
INSTITUTIONAL CONTROL PLAN AND OPERATION AND MAINTENANCE PLAN

Date 16-OCT-02 **Page 2** **Inspector** JRG

NEUTRON PROBE ACCESS TUBES (NPATs)

1. Inspect for integrity.		✓	✓	Neutron probe access tubes inspected during
2. Inspect for cleanliness.		✓	✓	each monitoring event. Locks, exterior of surface
3. Inspect operating condition of lock, rust on cover, well casing damage.		✓	✓	tubes and guard posts inspected. All locks were on the NPAT; however, they were not locked. Each lock was then closed & verified that it was locked.
4. Inspect guard posts around well cover to verify they are stable.		✓	✓	

ROCK ARMOR

1. Inspect to verify no more than 12 inches of subsidence of rock armor.		✓		Rock armor inspected and surveyed. No visual
2. Conduct topographical survey.		✓		or topographical data evidence of subsidence or erosion

Printed Name of Inspector John R. Giles

Signature John R. Giles

Photographs Taken ? (Yes) No

ANNUAL INSPECTION REPORT FORM FOR WAG 4

INSTITUTIONAL CONTROL PLAN AND OPERATION AND MAINTENANCE PLAN

Date 16-OCT-02 **CFA-08 Sewage Plant Drainfield and Spreading Area A** **Inspector** JRG

CFA DRAINFIELD CFA-08		
1. Document signs are in-place.		
2. Document No Excavations or Drilling.		
3. Inspect vegetation for sparse growth.		
4. Inspect vegetation for weed encroachment.		
5. Inspect vegetation for non-growth.		
6. Inspect for erosion.		
7. Inspect for subsidence.		
8. Inspect for animal intrusion.		
9. Inspect permanent markers.		
10. Conduct radiological survey.	✓	Radiological survey completed on October 24, 2002. 217 points.

Additional Comments or Notes:

The remedial action is nearing completion at this time. The tasks that remain are revegetation and completion of the fence. Additionally, warning signs (CERCLA), and permanent markers need to be placed.

Printed Name of Inspector John R. Giles

Photographs Taken ? **Yes** (No)

Signature John R. Giles